



Agency for Healthcare Research and Quality
Advancing Excellence in Health Care



NATIONAL
GUIDELINE
CLEARINGHOUSE

General

Guideline Title

Evaluation of vertigo in the adult patient

Bibliographic Source(s)

University of Texas at Austin School of Nursing, Family Nurse Practitioner Program. Evaluation of vertigo in the adult patient. Austin (TX): University of Texas at Austin, School of Nursing; 2014 May. 19 p. [18 references]

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

Strength of recommendations (A, B, C, D) and quality of evidence (1++, 1+, 1-, 2++, 2+, 2-, 3, 4) are defined at the end of "Major Recommendations" field.

Definitions

Dizziness is a general term used to describe a broad range of symptoms including pre-syncope, disequilibrium, vertigo and lightheadedness.

Vertigo is a subset of dizziness. Patients typically describe vertigo as the sensation of motion, rotation, spinning or tilting. They may also describe the environment as having these illusions.

Vertigo occurs due to asymmetry in the vestibular system from dysfunction of the labyrinth, vestibular nerve or central vestibular structures in the brainstem (Baloh, 1998; Chan, 2009; Delaney, 2003; Karatas, 2008; Wipperman, 2014).

Subjective Assessment

History of Present Illness

The healthcare provider should ask patients presenting with dizziness to describe the sensation in words other than "dizzy" in order to differentiate between pre-syncope, disequilibrium, vertigo and lightheadedness. Obtain clarification by asking the following questions:

- Does the room spin or do you feel like you are spinning?
- Are there any triggers, including positional changes?
- Do you feel lightheaded?

- Do you feel like you are going to faint?
- Do you experience a loss of balance or feel like you will fall? Have you fallen?
- How long does the vertigo last? (seconds, minutes, hours)
- How often does the vertigo occur?
- Do episodes occur in certain situations? (elevators, driving)
- Are the attacks clustered?
- Do you have ringing, buzzing or stuffy feeling in your ear(s) during an attack?
- Do you have associated symptoms such as:
 - Nausea
 - Vomiting
 - Chest pain
 - Diaphoresis
 - Aura
 - Headache
 - Diplopia or blurred vision
 - Dysarthria
 - Dysphagia
 - Weakness/paralysis/paresthesia
 - Ataxia
 - Confusion or other alterations of mental status
 - Decrease or loss of hearing (sudden, severe, unilateral or bilateral) that are associated with attacks

(Baloh, 1998; Broomfield et al., 2008; Chan, 2009; Karatas, 2008; Lanksa, 2013; Lee, 2012; Lynch, 2002; Mundhenke, 2010; Smith et al., 2012; Wipperman, 2014) (Grade A Recommendation, 1+ Level of Evidence)

Past Medical History

The provider should ask about the following:

- Recent head trauma, whiplash injuries
- Spinal cord disease (especially cervical)
- Barotrauma
- History of middle ear surgery
- Recent upper respiratory infection
- Straining with weight lifting and/or bowel movements
- Allergies
- Previous neurologic disorders
 - Transient ischemic attack
 - Cerebrovascular attack
 - Multiple sclerosis
 - Migraines
 - Mental status changes
- Cardiovascular disease
 - Hypertension
 - Myocardial infarction
 - Arrhythmias
 - Valvular disease
 - Thromboembolism
- Rheumatologic or autoimmune disorders
- Feelings of anxiety, depression or other mental illness

(Broomfield et al., 2008; Delaney, 2003; Lanksa, 2013; Post & Dickerson, 2010) (Grade A Recommendation, 1+ Level of Evidence)

Social History

The provider should ask about the following:

- Occupation
- Use of
 - Caffeine
 - Tobacco
 - Alcohol
 - Recreational drugs

(Lanska, 2013) (Grade B Recommendation, 2++ Level of Evidence)

Family History

The provider should ask if there is a family history of:

- Cardiovascular disease
- Transient ischemic attacks (TIA)
- Cerebral vascular accident (CVA)
- Migraines

(Lanska, 2013) (Grade B Recommendation, 2++ Level of Evidence)

Medications

Obtain a complete list of all medications. Consider removing any medication that could precipitate orthostatic hypotension.

Those that may cause dizziness and/or vertigo and are particularly significant are:

- Cardiac
- Central nervous system (i.e., sedatives, opiates)
- Urologic (i.e., loop diuretics, alpha-blockers, phosphodiesterase-5 inhibitors, anti-cholinergics)
- Aminoglycoside antibiotics (i.e., gentamicin, streptomycin) may cause ototoxicity
- Salicylates
- Chemotherapy
- Neuroleptics (i.e., phenytoin, carbamazepine)
- Tricyclic antidepressants
- Over-the-counter medications, supplements and homeopathic remedies should be noted

(Chan, 2009; Cherian, 2010; Gupta & Lipsitz, 2007; Lanska, 2013; Lee, 2012; Post & Dickerson, 2010) (Grade B Recommendation, 1+ Level of Evidence)

Objective Assessment

Physical Examination

Assessment should include:

- Dynamic visual acuity
- Hearing tests – whisper, Weber and Rinne
- Vital signs including orthostatic blood pressure
- Head and neck
- Ear, nose, throat
- Lungs
- Cardiovascular
- Musculoskeletal
- Neurologic, complete

(Broomfield et al., 2008; Cherian, 2010; Lanska, 2013) (Grade A Recommendation, 1+ Level of Evidence)

The most common cause of vertigo in the primary care setting is benign paroxysmal positional vertigo (BPPV) that is caused by a loose otolith in the semi-circular canals. Vertigo attacks are episodic, of seconds in duration, precipitated by positional changes or head turning and are frequently accompanied by nausea. BPPV affects mostly females between their fifth and seventh decade. Episodes will occur in spells lasting several weeks,

will spontaneous remit and return in weeks, months or even years later. Past head trauma is a common precipitating event in BPPV (Chan, 2009; Delaney, 2003; Halmagyi, 2005; Karatas, 2008; Lee, 2012; Post & Dickerson, 2010; Wippelman, 2014).

If a diagnosis of BPPV is suspected based on the subjective data, Dix-Hallpike maneuver is recommended (Broomfield et al., 2008; Lanska, 2013). (Grade A Recommendation, 1+ Level of Evidence)

- Dix-Hallpike maneuver:
 - While the patient is in sitting position, turn the patient's head 45° to one side, rapidly moving the patient from sitting to the supine position with the head hanging over the table about 20°. Observe 30 seconds for nystagmus.
 - Return the patient to the sitting position and then reassess for nystagmus.
 - Repeat on same side.
 - Repeat maneuver twice on opposite side.
- A positive Dix-Hallpike maneuver is diagnostic for BPPV, but does not rule it out if negative. The sensitivity of the maneuver ranges from 50% to 88%.
- In BPPV, nystagmus is caused by vestibular debris in the ear that is facing down closest to the exam table. The side that provokes symptoms is the affected ear.
- Typical nystagmus of BPPV is:
 - Horizontal and rotary, corresponding in duration to the patient's subjective vertigo, and occurring when positioning on the affected side
 - Reoccurs when returned to the sitting position, but in the opposite direction
 - Has a latency period of 1 to 45 seconds
 - Has limited duration of less than 60 seconds, and
 - Fatigues with repetition
- There are three types of BPPV, each associated with a semicircular canal:
 - Posterior
 - Horizontal
 - Vertical
- Posterior is the most common (85%–95%)

(Chan, 2009; Cherian, 2010; Delaney, 2003; Lanska, 2013; Lee, 2012; Post & Dickerson, 2010; Wippelman, 2014).

Evaluate nystagmus for clues to determine whether the etiology is from a central (non-vestibular) or peripheral (vestibular) source.

Consider peripheral vestibular dysfunction when:

- Vertigo:
 - Is temporary (24–48 hours) even if episodes reoccur for weeks and
 - Is accompanied by nausea and/or vomiting
- When the Dix-Hallpike maneuver elicits nystagmus that:
 - Fatigues with repetition
 - Decreases with visual fixation
 - Has latency from stimulus to onset
 - May be purely horizontal, or horizontal or vertical with a rotary component, never purely vertical
 - Typically unidirectional with a change in gaze

Deviations from these characteristics of nystagmus may occur, but raises the suspicion of central origin.

Consider central pathology when:

- Vertigo
 - Is spontaneous without stimulus
 - Is severe and persistent
 - Has a gradual onset
 - May occur without stimulus
- Patient is able to move and walk around without exacerbating symptoms.
- Other central nervous system symptoms are present such as sudden onset severe headache, weakness, ataxia or diplopia.
- When the Dix-Hallpike maneuver elicits nystagmus that:

- Does not have a latency period but occurs or immediately upon the head-down position
- Has a duration of greater than 1 minute
- May be pendular, purely horizontal, vertical or rotary
- Does not diminish with repetition of maneuver
- Does not suppress with visual fixation
- Often bidirectional with a change in gaze

(Baloh, 2003; Delaney, 2003; Lee, 2012; Hoffman, Einstadter, & Kroenke, 1999; Lanska, 2013; Wipperman, 2014) (Grade A Recommendation, 1+ Level of Evidence)

Diagnostics

- Serological testing has a low yield in identifying a specific cause, but the provider should determine if the following are appropriate:
 - Complete blood count to rule out anemia and infection
 - Comprehensive metabolic panel and thyroid function tests to rule out metabolic problems
 - Erythrocyte sedimentation rate, rheumatoid factor, antinuclear antibody titer, Lyme titer to rule out autoimmune disease
 - Lipid profile to rule out possible fat emboli that frequently affects the 8th cranial nerve
 - Rapid plasmin reagin (RPR) test to rule out undiagnosed syphilis

(Hoffman, Einstadter, & Kroenke, 1999; Lynch, 2002; Post & Dickerson, 2010) (Grade B Recommendation, 2++ Level of Evidence)

- Imaging
 - If central lesion is suspected, consider obtaining a magnetic resonance imaging (MRI) scan (Broomfield et al., 2008; Delaney, 2003). (Grade A Recommendation, 1+ Level of Evidence)

Diagnosis

Some common etiologies for vertigo are:

- True, vestibular vertigo
 - Benign paroxysmal positional vertigo (BPPV)
 - Meniere's disease: vertigo that is intractable, positional, episodic with duration of 20 minutes to several hours, accompanied by fluctuating sensorineural hearing loss, tinnitus, sensation of aural fullness
 - Acute vestibular failure (i.e., vestibular neuritis, labyrinthitis): vertigo is long lasting and/or disabling
- Non-vestibular vertigo and dizziness can be described as unsteadiness, imbalance, disequilibrium, pre-syncope or lightheadedness.
 - Multisystem or balance disorders
 - Recreational drugs or alcohol abuse
 - Vitamin deficiency
 - Neurological (intracranial neoplasm, demyelinating disease, Parkinson's disease, dementia)
 - Mental or psychogenic disorders (anxiety, phobias, depression)
 - Cardiovascular disease (arrhythmias, valvular disease, thromboembolism, hypertension, orthostatic hypotension, TIA, CVA)
 - Adverse effects of therapeutic medications
 - Cervical vertigo
 - Migraine headaches may be associated visual aura during the attacks:
 - Vestibular migraine - photophobia, phonophobia, precipitated by foods, alcohol, sensory stimuli or situations
 - Basilar migraine – May be occipital and followed by vertigo, tinnitus, decreased hearing, diplopia, ataxia, dysarthria, bilateral paresthesia, impaired cognition

(Baloh, 2003; Broomfield et al., 2008; Chan, 2009; Cherian, 2010; Delaney, 2003; Hoffman, Einstadter, & Kroenke, 1999; Karatas, 2008; Lynch, 2002; Mundhenke, 2010; Post & Dickerson, 2010; Wipperman 2014)

Referrals

The provider should make timely referrals:

- Neurological findings such as new, severe headache, abnormal gait, diplopia, weakness, and/or paresthesia should necessitate an admission to the Emergency Department, imaging and/or timely consultation with a neurologist.
- Refer to an otolaryngologist for audiometry and vestibular function testing for recurrent vertigo, if episodes last longer than 2 weeks, or if the

symptoms are considered disabling.

- Cardiovascular findings, such as palpitations, suspected dysrhythmias, hypotension, hypertension, chest pain, pre-syncope, or exercise intolerance should necessitate an electrocardiogram (EKG), admission to the Emergency Department or immediate referral to a cardiologist.
- If the primary care provider (PCP) is not familiar with postural maneuvers as treatment for BPPV, they may refer patients to physical therapy or audiologist for the Epley canalith repositioning procedure.
- A consult to a mental health profession may be appropriate for those patients without objective findings and suspected psychogenic origin.

(Cherian, 2010; Hoffman, Einstadter, & Kroenke, 1999; Lanska, 2013; Lynch, 2002; Smith et al., 2012) (Grade B Recommendation, 2++ Level of Evidence)

Definitions:

Scottish Intercollegiate Guidelines Network (SIGN) Strength of Recommendations

A. At least one meta-analysis, systematic review, or randomized controlled trial (RCT) rated as 1++, and directly applicable to the target population; *or*

A systematic review of RCTs or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results.

B. A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; *or*

Extrapolated evidence from studies rated as 1++ or 1+.

C. A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; *or*

Extrapolated evidence from studies rated as 2++.

D. Evidence level 3 or 4; *or*

Extrapolated evidence from studies rated as 2+.

SIGN Levels of Evidence

1++ High-quality meta-analyses, systematic reviews of randomized controlled trials (RCTs) or RCTs with a very low risk of bias

1+ Well-conducted meta-analyses, systematic reviews of RCTs or RCTs with a low risk of bias

1- Meta-analyses, systematic reviews of RCTs or RCTs with a high risk of bias

2++ High-quality systematic reviews of case-control or cohort studies;

High-quality case-control or cohort studies with a very low risk of confounding, bias, or chance and a high probability that the relationship is causal

2+ Well-conducted case-control or cohort studies with a low risk of confounding, bias, or chance and a moderate probability that the relationship is causal

2- Case control or cohort studies with a high risk of confounding, bias, or chance and a significant risk that the relationship is not causal

3 Non-analytic studies, e.g., case reports, case series

4 Expert opinion

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Vertigo

Guideline Category

Diagnosis

Evaluation

Clinical Specialty

Family Practice

Geriatrics

Internal Medicine

Neurology

Nursing

Otolaryngology

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Nurses

Occupational Therapists

Physical Therapists

Physician Assistants

Physicians

Psychologists/Non-physician Behavioral Health Clinicians

Guideline Objective(s)

- To provide evidence-based guidelines for the evaluation of vertigo in the adult patient
- To identify common causes of vertigo in adult patients
- To identify warning signs that would necessitate timely referral

Target Population

Adult male and female patients aged 19 years and older who present with a complaint of vertigo

Interventions and Practices Considered

1. Subjective assessment
 - History of present illness
 - Past medical history

- Social history
 - Family history
 - Complete list of all medications
2. Objective assessment
 - Physical examination
 - Dix-Hallpike Maneuver
 - Laboratory tests (e.g., complete blood count, comprehensive metabolic panel, tests for autoimmune disease, Lyme titer, rapid plasmin reagin [RPR] for syphilis)
 - Magnetic resonance imaging (MRI)
 3. Consideration of differential diagnosis
 4. Timely referrals to specialists

Major Outcomes Considered

Sensitivity and specificity of diagnostic assessments

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

A systematic review of the literature was undertaken to determine common etiologies of vertigo and provide evidence-based guidelines for the evaluation of vertigo in the adult patient.

Searches of Electronic Databases: Online searches were performed for the timeframe of December 1998 to March 2014 using the following databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL), Cochrane Review, Medline, Medscape, PubMed. Search terms included benign paroxysmal positional vertigo (BPPV), vertigo, vestibular disorders, dizziness using the Boolean connector "OR."

Number of Source Documents

Papers meeting critical appraisal criteria for inclusion in evidence base: 40

Methods Used to Assess the Quality and Strength of the Evidence

Subjective Review

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Scottish Intercollegiate Guidelines Network (SIGN) Levels of Evidence

1++ High-quality meta-analyses, systematic reviews of randomized controlled trials (RCTs) or RCTs with a very low risk of bias

1+ Well-conducted meta-analyses, systematic reviews of RCTs or RCTs with a low risk of bias

1- Meta-analyses, systematic reviews of RCTs or RCTs with a high risk of bias

2++ High-quality systematic reviews of case-control or cohort studies;

High-quality case-control or cohort studies with a very low risk of confounding, bias, or chance and a high probability that the relationship is causal

2+ Well-conducted case-control or cohort studies with a low risk of confounding, bias, or chance and a moderate probability that the relationship is causal

2- Case control or cohort studies with a high risk of confounding, bias, or chance and a significant risk that the relationship is not causal

3 Non-analytic studies, e.g., case reports, case series

4 Expert opinion

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The guideline developers reviewed journal articles for quality based on the study design, method, number of subjects, representative sample, generalizability of results, and applicability for target population.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The panel convened and discussed; unanimous agreement was made upon recommendations.

Rating Scheme for the Strength of the Recommendations

Scottish Intercollegiate Guidelines Network (SIGN) Strength of Recommendations

A. At least one meta-analysis, systematic review, or randomized controlled trial (RCT) rated as 1++, and directly applicable to the target population; *or*

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C. A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; *or*

Extrapolated evidence from studies rated as 2++.

D. Evidence level 3 or 4; *or*

Extrapolated evidence from studies rated as 2+.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

The guideline was created by a panel of advance practice nurses and submitted for internal review to the Family Nursing Practitioner Program faculty and expert reviewer. Before submitting to the guideline committee, revisions were made based on reviewer recommendations. An external expert reviewer approved the guideline prior to final submission to the National Guideline Clearinghouse.

Evidence Supporting the Recommendations

References Supporting the Recommendations

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Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

- Accurate evaluation of complaint of vertigo
- Improving quality of life for patient
- Ruling out potential life-threatening etiologies

Potential Harms

Patient discomfort or exacerbation of symptoms during examination

Qualifying Statements

Qualifying Statements

These guidelines are to be used by medical professionals in clinical practice. They provide a general framework for evaluating the adult patient with vertigo and do not include specialized assessments and testing.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

University of Texas at Austin School of Nursing, Family Nurse Practitioner Program. Evaluation of vertigo in the adult patient. Austin (TX): University of Texas at Austin, School of Nursing; 2014 May. 19 p. [18 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2014 May

Guideline Developer(s)

University of Texas at Austin School of Nursing, Family Nurse Practitioner Program - Academic Institution

Source(s) of Funding

University of Texas at Austin, School of Nursing, Family Nurse Practitioner Program

Guideline Committee

University of Texas at Austin, School of Nursing, Family Nurse Practitioner Program

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Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: None available.

Print copies: Available from the University of Texas at Austin, School of Nursing, 1700 Red River, Austin, Texas, 78701-1499, Attn: Nurse Practitioner Program

Availability of Companion Documents

None available

Patient Resources

None available

NGC Status

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